

WHAT IS CLAIMED IS:

1. A method of dynamically generating and serving web pages, the method comprising:

receiving a page request at a server, the page request generated by a web browser running on a user computer and corresponding to a web page that is generated dynamically;

in response to the page request, sending a service request to a service to request service data to incorporate into the web page;

before the service returns the service data, transmitting to the web browser a first portion of the web page, said first portion including viewable content, and including a placeholder for the requested service data;

after the service returns the service data and before the web page has been fully loaded, transmitting to the web browser a second portion of the web page, the second portion including the service data; and

transmitting to the user computer a page update handler which, when executed by the web browser, incorporates the service data included within the second portion of the web page into the first portion of the web page in a viewable form.

2. The method of Claim 1, wherein the placeholder comprises a display object, and the page update handler populates the display object with at least some of the service data included within the second portion of the web page.

3. The method of Claim 2, wherein the display object is positioned above at least some of said viewable content within the first portion of the web page.

4. The method of Claim 1, wherein the service data is included in the second portion of the web page in a condensed form in which at least some format coding is omitted, and the page update handler adds format coding to the service data to format the service data for display, whereby a quantity of data transmitted to the web browser is reduced.

5. The method of Claim 1, wherein the service data is included in the second portion of the web page in a hidden format.

6. The method of Claim 1, wherein the page update handler is transmitted to the user computer as part of the first portion of the web page.

7. The method of Claim 1, wherein the page update handler is transmitted to the user computer as part of a library file, separately from the web page.

8. The method of Claim 1, wherein the placeholder for the requested service data is included within the first portion of the web page in response to a failure of the service to return the service data within a selected time interval.

9. The method of Claim 1, wherein the placeholder for the requested service data is included within the first portion of the web page in response to a server decision to defer rendering of a portion of the web page, said server decision being based at least in part on response time data collected for the service.

10. The method of Claim 1, wherein the placeholder for the requested service data is included within the first portion of the web page in response to a server decision to defer rendering of a portion of the web page, said server decision taking into consideration at least one of the following: (a) a load level of the service, (b) a load level of a web server system that responds to the page request.

11. The method of Claim 1, wherein the second portion of the web page includes a command that causes the web browser to execute the page update handler.

12. The method of Claim 1, wherein the first portion of the web page includes a command that causes the web browser to execute the page update handler upon completion of loading of the web page.

13. The method of Claim 1, wherein the page update handler comprises a JavaScript function.

14. The method of Claim 1, wherein the service request is one of a plurality of service requests generated in response to the page request.

15. The method of Claim 1, wherein the page update handler incorporates the service data into the first portion of the web page as mouse-over text that is displayed by the web browser when a mouse cursor is positioned over a corresponding display element.

16. The method of Claim 1, wherein the page update handler selects a display format to use to display the service data in the web page based at least in part on a dimension of a window of the web browser running on the user computer.

17. The method of Claim 1, wherein the page update handler selects a display format to use to display the service data in the web page based at least in part on a quantity of the service data.

18. A method of responding to a request from a web browser for a web page, the method comprising:

    sending a service request to a service to request service data to be displayed within a portion of the web page;

    if the service returns the requested service data within a selected time interval, populating said portion of the web page with the service data prior to transmitting the web page to the web browser; and

    if the service does not return the requested service data within the selected time interval: (a) transmitting at least said portion of the web page to the web browser without the service data, (b) in response to receiving the service data from the service, transmitting the service data to the web browser, and (c) invoking a page update handler which, when executed by the web browser, populates said portion of the web page with the service data transmitted in (b).

19. The method of Claim 18, wherein the page update handler incorporates the service data into the portion of the web page above other viewable content included in the portion of the web page.

20. The method of Claim 18, wherein the service data is transmitted to the web browser as part of the web page, and is moved or copied to the portion of the web page by the page update handler.

21. The method of Claim 18, wherein the service data is transmitted to the web browser within a separate web page within a hidden window.

22. The method of Claim 18, wherein invoking the page update handler comprises including, within the web page portion transmitted in (a), a command that causes the web browser to execute the page update handler upon completion of loading the web page.

23. The method of Claim 18, wherein the page update handler populates the portion of the web page with the service data before the web page has finished loading.

24. The method of Claim 18, wherein the page update handler selects a display format to use to display the service data in the web page based at least in part on a size of a window of the web browser.

25. The method of Claim 18, wherein the page update handler selects a display format to use to display the service data in the web page based at least in part on a quantity of the service data.

26. A web server system configured to respond to page requests from web browsers according to the method of Claim 18.

27. A method of generating a web page in response to a request from a web browser, the method comprising:

- (a) sending a service request to a service to request service data to be displayed in the web page;

- (b) transmitting to the web browser at least a first portion of the web page, said first portion including content that may be viewed within the web browser while the service request is pending;

- (c) after the service responds to the service request by returning the service data, sending the service data to the web browser; and

- (d) instructing the web browser to execute a page update handler that, when executed, incorporates a viewable representation of the service data, as transmitted in (c), into the first portion of the web page.

28. The method of Claim 27, wherein the first portion of the web page includes a display object that is initially displayed without the service data, and which is subsequently populated with the service data by the page update handler.

29. The method of Claim 28, wherein the display object is positioned above at least some of said content within the first portion of the web page.

30. The method of Claim 27, wherein step (c) comprises transmitting the service data as part of the web page before the web page has finished loading.

31. The method of Claim 27, wherein step (c) comprises transmitting the service data to a secondary web page within a hidden window that is accessed by the page update handler.

32. The method of Claim 27, wherein the first portion of the web page is transmitted to the web browser while the service request is pending.

33. The method of Claim 27, wherein step (d) comprises including within the first portion of the web page a command that causes the web browser to execute the page update handler upon completion of loading the web page.

34. The method of Claim 27, wherein step (d) comprises including with the service data transmitted in step (c) a command that causes the web browser to execute the page update handler.

35. The method of Claim 27, wherein at least step (d) is performed in response to a failure of the service to return the requested service data within a selected time interval.

36. The method of Claim 27, wherein at least step (d) is performed in response to a server decision to defer rendering of a portion of the web page, said server decision being based at least in part on response time data collected for the service.

37. The method of Claim 27, wherein step (d) in response to a server decision to defer rendering of a portion of the web page, said server decision taking into consideration at least one of the following: (1) a load level of the service, (2) a load level of a web server system that responds to the request from the web browser.

38. The method of Claim 27, wherein the page update handler incorporates the service data into the first portion of the web page as mouse-over text that is displayed by the web browser when a mouse cursor is positioned over a corresponding display element.

39. A web server system configured to perform the method of Claim 27.

40. A web page generated according to the method of Claim 27 represented within a computer memory.

41. The method of Claim 27, wherein step (c) comprises sending the service data to the web browser in a substantially unformatted form to reduce a quantity of data transmitted to the web browser, wherein the page update handler adds format coding to the service data to incorporate the viewable representation of the service data into the web page.

42. The method of Claim 27, wherein the page update handler selects a display format to use to display the service data in the web page based at least in part on a dimension of a window of the web browser.

43. The method of Claim 27, wherein the page update handler selects a display format to use to display the service data in the web page based at least in part on a quantity of the service data.

44. A method of generating web pages, comprising:

at a web server, receiving a page request from a web browser, and responding to the page request by transmitting a web page to the web browser, said web page including a visual element that is selectable by a user to cause the web page to be updated with service data; and

preemptively retrieving the service data from a service, and transmitting the service data from the web server to the web browser in a hidden format, before the user selects the visual element, wherein the step of preemptively retrieving the service data and transmitting the service data to the web browser is performed based at least in part on a programmatic prediction of a likelihood that a user who requested the web page will select the visual element;

wherein the web page is responsive to user selection of the visual element during viewing of the web page by invoking a page update handler which, when executed by the web browser, causes the web page to be updated with a representation of the service data as transmitted to the web browser in said hidden format, such that the update to the web page occurs without having to retrieve the service data from the web server when the visual element is selected.

45. The method of Claim 44, wherein the programmatic prediction is based at least in part on an analysis of past browsing activities of the user.

46. The method of Claim 44, wherein the programmatic prediction is based at least in part on an analysis of past browsing activities of a plurality of users.

47. The method of Claim 44, wherein the page update handler selects a display format with which to integrate the service data into the web page.

48. The method of Claim 47, wherein the page update handler selects the display format based at least in part on a size of a browser window in which the web page is displayed.